REMARKS

I. INTRODUCTION

Claims 1-15 are pending in the present application. In view of the following remarks, it is respectfully submitted that all of the pending claims are allowable.

II. CLAIM REJECTIONS – 35 U.S.C. § 102(e)

Claims 1, 10 and 13-15 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent 6,558,231 to Taylor (hereinafter "Taylor") and US. Patent 6,403,931 to Zhou et al. (hereinafter "Zhou") as incorporated into Taylor by reference. (See 3/19/08 Office Action, p. 2.)

Taylor discloses a two-step electrochemical process for smoothing the surface of an electrolytically dissolvable metal. (See Taylor, Abstract.) In the first step, large asperities 404 are reduced to a height comparable with those of microasperities 406. (See Taylor, col. 6, ll. 14-17; Fig. 4B.) The first step may involve pulses in the range of 0.1 microsecond to 100 milliseconds, with off-times or reverse times that may range from 10 microseconds to 500 milliseconds; the duty cycle may preferably be no greater than 50%, and more preferably less than 25% or even less than 10%. (See id., col. 5, ll. 41-54; Fig. 2.) The first step may typically reduce the height of macroasperities to less than about 100 μm. (See id., col. 5, ll. 33-36.) In the second step, both the original macroasperities 404 and the microasperities 406 are substantially reduced in height. (See id., col. 6, ll. 63-67; Fig. 4C.) The second step involves the use of a pulse width of at least 100 milliseconds, and preferably at least 500 milliseconds, with shorter off-times or reverse times than in the first step; the duty cycle may be greater than 50%, and is preferably greater than 75% or even 90%. (See id., col. 6, ll. 45-53; Fig. 3.) The second step may reduce the final roughness of the surface to 0.1 μm or less. (See id., col. 6, ll. 35-37.)

Claim 1 recites "[a] method for determining an optimal mode for a removal of cathode depositions from an electrode during an electrochemical machining of an electrically conductive

work piece in an electrolyte by means of applying bipolar electrical pulses between the work piece and the electrode, one or more voltage pulses of an unipolar machining polarity being alternated with voltage pulses of an inverse polarity while a gap between the work piece and the electrode is maintained, said gap being filled by the electrolyte, *wherein during said optimal mode an optimal duration of the pulses of the inverse polarity is selected, said optimal duration being determined from a first calibration carried out preceding the machining of the work piece and a second calibration carried out during the machining of the work piece*."

Taylor contains neither a determination of an optimal pulse duration, nor disclosure that said optimal pulse duration should be determined based on a first calibration carried out prior to machining and a second calibration carried out during machining. Zhou also does not disclose any such determination. Moreover, the Examiner fails to assert that either Taylor or Zhou discloses such a determination in either the Non-Final Rejection or the Final Rejection. (See 9/19/07 Office Action, pp. 2-3; 3/19/08 Office Action, p. 2.) Rather, the Examiner cites the two-step method disclosed by Taylor, using the underlying technique described by Zhou, which differs from the recitation of claim 1. Accordingly, this rejection should be withdrawn.

Claim 10 recites "[a] method for electrochemical machining of an electrically conductive work piece in an electrolyte by applying bipolar electrical pulses between the work piece and an electrode, one or more voltage pulses of an unipolar machining polarity being alternated with voltage pulses of an opposite polarity while a gap between the work piece and the electrode in maintained, said gap being filled by the electrolyte, wherein said method comprises the steps of: *establishing an optimal pulse duration for pulses of the inverse polarity for a removal of the cathode depositions from an electrode surface during the electrochemical machining, said optimal pulse duration being determined from a first calibration carried out preceding the machining of the work piece and a second calibration carried out during the machining of the work piece*; performing a control of the machining of the work piece by means of a monitoring of an actual value of an operational parameter and comparing said actual value of the operational parameter to a preset value of the operational parameter; applying a pulse of the inverse polarity

of the optimal pulse duration in case the actual value of the operational parameter is greater than the preset value of the operational parameter."

The Applicants respectfully submit that Taylor and Zhou (as incorporated into Taylor by reference) do not disclose "establishing an optimal pulse duration for pulses of the inverse polarity for a removal of the cathode depositions from an electrode surface during the electrochemical machining, said optimal pulse duration being determined from a first calibration carried out preceding the machining of the work piece and a second calibration carried out during the machining of the work piece," as recited in claim 10, for the reasons discussed above with reference to claim 1. Accordingly, this rejection should be withdrawn.

Claim 13 recites "[a] control system arranged to control an automatic removal of cathode depositions from a surface of an electrode during a bipolar electrochemical machining, wherein said system comprises: probing means arranged to perform a measurement of a value of an operational parameter; calibration means arranged to perform a numerical calibration of a variable representative to a condition of the surface of the electrode based on the value of the operational parameter; a storage unit arranged to store a dependence between the variable and a duration of an optimal inverse pulse necessary to remove said condition; monitoring means arranged to monitor an actual value of the operational parameter; *a logical unit arranged to compare said actual value of the operational parameter with a preset value of the operational parameter and to actuate an application of the optimal pulses of inverse polarity in case the actual value of the operational parameter is greater than the preset value of the operational parameter, parameters of the optimal inverse pulse being determined by the calibration and the dependence stored in the storage unit.*"

The Applicants respectfully submit that Taylor and Zhou (as incorporated into Taylor by reference) do not disclose "a logical unit arranged to compare said actual value of the operational parameter with a preset value of the operational parameter and to actuate an application of the optimal pulses of inverse polarity in case the actual value of the operational parameter is greater than the preset value of the operational parameter, parameters of the optimal inverse pulse being

determined by the calibration and the dependence stored in the storage unit," as recited in claim 13, for the reasons discussed above with reference to claim 1. Accordingly, this rejection should be withdrawn. Because claims 14 and 15 depend from, and, therefore, include all of the limitations of claim 1, it is respectfully submitted that these claims are also allowable for at least the reasons stated above.

III. CLAIM REJECTIONS – 35 U.S.C. § 103(a)

Claims 2-9 and 11-12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Taylor as applied to claims 1 and 10 in view of U.S. Patent 5,833,835 to Gimaev et al. (hereinafter "Gimaev"). (See 3/19/08 Office Action, pp. 2-3.)

Gimaev discloses a method wherein the amplitude of pulses used to machine a workpiece is altered between two predetermined values. (See Gimaev, Abstract.) Gimaev does not disclose the determination of an optimal pulse duration. Therefore, Gimaev fails to cure the deficiencies of Taylor discussed above with reference to claim 1. Accordingly, Taylor and Gimaev, alone or in combination, neither disclose nor suggest "wherein during said optimal mode an optimal duration of the pulses of the inverse polarity is selected, said optimal duration being determined from a first calibration carried out preceding the machining of the work piece and a second calibration carried out during the machining of the work piece," as recited in claim 1. Because claims 2-9 depend from, and, therefore, include all of the limitations of claim 1, it is respectfully submitted that these claims are also allowable for at least the same reasons.

Similarly, Taylor and Gimaev, alone or in combination, neither disclose nor suggest "establishing an optimal pulse duration for pulses of the inverse polarity for a removal of the cathode depositions from an electrode surface during the electrochemical machining, said optimal pulse duration being determined from a first calibration carried out preceding the machining of the work piece and a second calibration carried out during the machining of the work piece," as recited in claim 10. Because claims 11 and 12 depend from, and, therefore,

include all of the limitations of claim 1, it is respectfully submitted that these claims are also allowable for at least the same reasons.

CONCLUSION

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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By: ______________________

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